RESOLUTION 2018-18

STATE OF TEXAS § IN THE COMMISSIONERS COURT

COUNTY OF COMAL §

RESOLUTION OF COMAL COUNTY AUTHORIZING THE FILING OF A GRANT APPLICATION WITH THE TEXAS WATER DEVELOPMENT BOARD (TWDB) FOR A FLOOD PROTECTION GRANT; AUTHORIZING ROBERT BOYD TO ACT ON BEHALF OF COMAL COUNTY IN ALL MATTERS RELATED TO THE APPLICATION; AND PLEDGING THAT IF A GRANT IS RECEIVED, COMAL COUNTY WILL COMPLY WITH THE GRANT REQUIREMENTS OF THE TEXAS WATER DEVELOPMENT BOARD.

WHEREAS, the Texas Water Development Board (TWDB) has opened a Flood Protection Grant to provide assistance to political subdivisions to implement prevention and/or corrective measures for reducing loss of life and property due to a flood; and

WHEREAS, Comal County is qualified to apply for grant funds under the Request for Applications.

NOW, THEREFORE, BE IT RESOLVED BY THE COMMISSIONERS COURT OF COMAL COUNTY IN NEW BRAUNFELS, TEXAS THAT:

1. Assistant County Engineer, Robert Boyd, is authorized to request grant funding under the TWDB's Request for Applications for Flood Protection Grants and act on behalf of Comal County in all matters related to the grant application and any subsequent grant contract and grant project that may result.

2. Comal County has the authority to plan and implement projects in the proposed project area.

3. The proposed project does not duplicate existing projects.

4. If the project is funded, Comal County will commit matching funds in cash and/or in-kind services.

PASSED AND ADOPTED by Comal County Commissioners' Court in New Braunfels, Texas on this the, 5th day of July, 2018.

Sherman Krause, County Judge

Donna Eccleston
Commissioner, Pct. #1

Scott Haag
Commissioner, Pct. #2

Kevin Webb
Commissioner, Pct. #3

Jen Crownover
Commissioner, Pct. #4

Attest: Bobbie Koepp
Comal County Clerk

COMMISSIONERS' COURT
COMAL COUNTY, TEXAS

Texas Water Development Board
Fiscal Year 2018 and 2019 Flood Protection Grant
Application

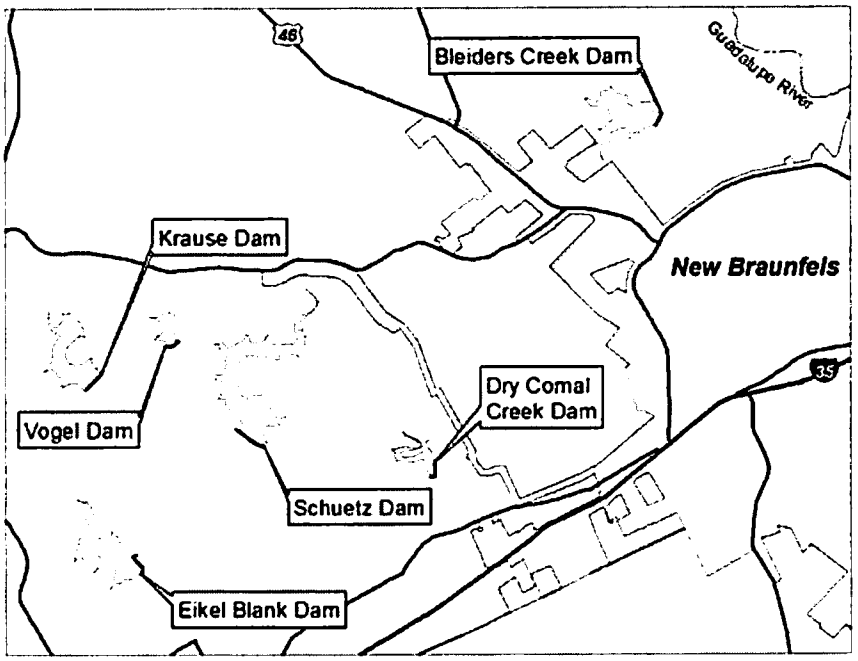
I. PROJECT INFORMATION

1. Legal name of applicant: **Comal County**
2. Participating political subdivision: **Comal County**
3. Official representative:
   Name: **Robert Boyd, P.E.**
   Title: **Assistant County Engineer**
   Address: **195 David Jonas Drive**
   New Braunfels, TX 78132
   Phone: **(830) 608-2090**
   Fax: **(830) 608-2009**
   E-mail: **boydro@co.comal.tx.us**
4. Total Project Cost: **$197,100**
5. Total grant funds requested form the Texas Water Development Board: **$98,550**
6. Applicant cash contribution to study: **$98,550**
7. Source of cash contribution: **Comal County budgeted funds**
8. Applicant in-kind contribution, including a description of in-kind services to be provided: **None**
9. Identify the watershed for which flood protection tasks will be addressed: **Comal Watershed**

II. PROJECT EVALUATION CRITERIA

10. Identify the purpose of the project which may be one or more of the following:
    b. to provide an early warning system as a tool for communities to warn its constituents in the event of a flood.
    c. to help communities better respond to a flood event on a local level and to minimize long-term hardships associated with the event.
11. Provide a detailed scope of work for the proposed project, not to exceed six pages, including the method(s) of monitoring progress:
    Install USGS gauging stations at the following locations:
    - **Soil Conservation Site Number 1 also known as Krause Dam (TX04547)**
    - **Soil Conservation Site Number 3 also known as Bleider's Creek Dam (TX01550)**
    - **Soil Conservation Site Number 4 also known as Eikel-Blank Dam (TX01546)**
    - **Soil Conservation Site Number 5 also known as Vogel Dam (TX01545)**
    - **Dry Comal Creek Flood Retarding Structure (TX07287)**

    Progress would be monitored through communication with USGS and site visits to each of the sites during construction. Also, please see summary from USGS on how these gauges can be used to continue to develop a regional response to flooding.



All six dams within Comal County are located as to provide maximum protection to the primary population center in Comal County (New Braunfels). In addition, the dams are designed to work in concert with one another to reduce the overall peak flow through the City of New Braunfels. By being able to track the functionality of the dams (amount of impounded water, the height of water behind the dam in relation to the height of the emergency spillway), the impact to the major population center in Comal County can be tracked in real time and with real data.

Flood inundation monitoring systems to enable flood early warning.

Why we act

Annual flood losses across the United States over the last 30 years averaged about $7.96 billion with 82 fatalities per year. In 2011 alone, there was a reported $9.1 billion in direct damages and 113 reported fatalities due to flooding in the United States[1]. While floods are impossible to prevent completely, and there is no way to guarantee protection of property, the U.S. Geological Survey (USGS), National Weather Service (NWS), and other federal, state, and local agencies have shown that the economic impacts and loss of life associated with flooding can be greatly reduced with *more informed flood warning systems*[2].

What can the USGS do to empower flood warning systems?

A key aspect of flood warning systems is having a network of rainfall and streamflow gauging stations located upstream of at-risk areas. These gauging networks can provide advanced notice of potential impending floods. Data from typical USGS gauging stations in the network are transmitted hourly from the river bank and posted on the USGS National Water Information Systems (NWIS) website (waterdata.usgs.gov).

In conjunction with streamflow monitoring stations, several USGS Water Science Centers across the nation have also undertaken flood inundation mapping projects, usually in partnership with local or state cooperators. Most of these projects involve using hydraulic models to develop a series of maps that show which areas are at-risk of flooding for a given water-level (stage) at a USGS streamflow gauging station, often referred to as a flood atlas (for example, a map of stream inundation for each 2 feet of stage increase). Using the USGS Flood Inundation Mapping Program (FIM), these flood atlases can be served through the internet to the public or relevant stakeholders. A user can view real-time

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[1] National Oceanic and Atmospheric Administration, 2017a: National Weather Service. *http://www.nws.noaa.gov/hic*, accessed July 11, 2017.

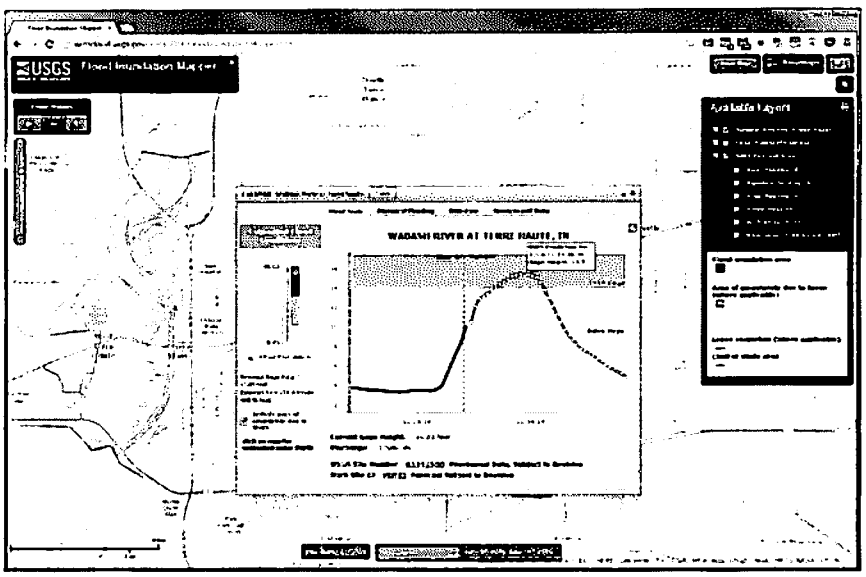
[2] EASPE, I., 2002. Use and Benefits of the National Weather Service River and Flood Forecasts. *http://www.nws.noaa.gov/oh/ahps/AHPS Benefits.pdf*, accessed July 27, 2017.

stage data from a USGS stream gage or forecast stage for a NWS flood forecast point and quickly access the flood map corresponding to the stage data.

Our objectives

To help assess potential risks associated with flooding events the USGS, in cooperation with local stakeholders and state government, develop flood inundation monitoring systems. This typically includes installation and maintenance (or upgrade) of a real-time rainfall and streamflow-gage monitoring network, development of one- and potentially two- or three-dimensional hydraulic models of the river system involved in a particular project, and hosting of the generated flood inundation atlases on the USGS Flood Inundation Mapper (wimcloud.usgs.gov/apps/FIM/FloodInundationMapper.html) and other modern visualization tools like the Interagency Flood Risk Management FIM Viewer (www.InFRM.us).

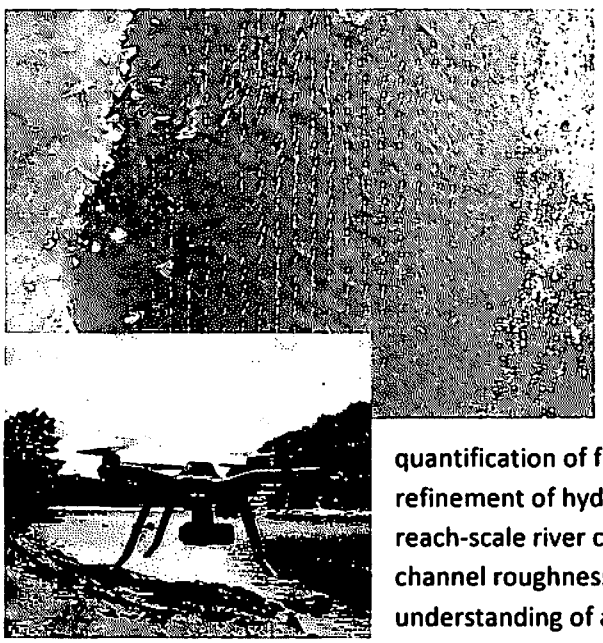
Our approach



To create the framework necessary for an effective flood monitoring system typically requires the installation or upgrade of the streamflow gauging network along the river section of interest. This network provides hydrologic information of inputs to the river channel typically through inclusion of a precipitation sensor network, especially in the main contributing areas of the river basin. The USGS is incorporating new sensor technologies at more gages, like high-intensity rainfall pluvio sensors to better capture the conditions in flash flood alley. These rain gages provide the public and emergency management personnel early notification of intense rainfall that might result in possible flood conditions downstream though near real-time transmission to internet-based informational products such as USGS Texas Water Dashboard and Water On-The-Go mobile app (txpub.usgs.gov/water-onthego/). Text or email alerts notification when potential flood-producing rainfall or streamflow conditions occur in the watershed can be provided through the USGS Water Alert System (water.usgs.gov/wateralert/) or the Texas Water Dashboard.

The streamflow gauging network observations are then ingested, along with all available historical observation and metadata, into computer-simulation hydraulic (and if needed, hydrologic) models of the river reach in question to predict areas that could be inundated under varying flood conditions.

Maps of the areal extents of inundation and flood depths are compiled to form a flood atlas for the river. This flood atlas is then incorporated into the USGS Flood Inundation Mapper (FIMapper) and made readily available to stakeholders and the public. The FIMapper allows users to explore the full set of inundation maps that shows where flooding would occur given a selected stream condition. Users can also access historical flood information and potential loss estimates based on the severity of the flood. The FIMapper website helps communities visualize potential flooding scenarios, identify areas and resources that may be at risk, and enhance their local response effort during a flooding event.



New approaches and technologies

The USGS is constantly innovating ways to better fulfill our mission to provide science which protects lives and livelihoods. These innovations further empower decision makers during events, for example by providing non-contact streamflow measurements from cameras mounted at gages, or even videos taken by first responders themselves. Unmanned Aerial Systems (UAS) can actively map flood extents *during* an event, or provide quantification of flow velocities and discharges that can be used in refinement of hydraulic models. UAS also provide a way to determine reach-scale river channel metrics like width, bank topography, and channel roughness which can be used to improve our hydraulic understanding of a river.

Incorporation and development of emerging technology is an important way the USGS provides timely water information for river managers, other stakeholders, and the public.

12. Describe the severity of the existing or potential flood hazard: **Comal County has experienced several flood events in recent history. October 1998, June 2002, May 2015, and October 2015 were all flood events where Comal County experienced some level of damage that triggered assistance from FEMA. This assistance ranged from less than $100,000 to several million dollars. Due to the location of the Comal County seat, New Braunfels is subject to severe flooding which could cause severe damage up to and including loss of life.**
13. Describe how the project, once implemented, will reduce loss of life? What is the size of the population protected by the project? How is public safety enhanced? **USGS gauging systems will provide accurate, real-time readings on each of the dams maintained by Comal County. This data can be used to guide elected officials and first responders in making critical decisions regarding public service announcements up to, and including, evacuations. The size of the population protected by the project is approximately 74,000 and is consistently considered one of the fastest growing cities in the United States. Public safety is enhanced due to the decreased time in receiving critical information during severe weather events.**
14. Describe how the project, once implemented, will reduce the loss of property? What is the economic benefit of the project in terms of the structures or services protected? **With real-time data available, residents downstream of the dams will have increased response time to protect their property which will provide a significant economic benefit.**
15. Provide a Project Schedule for completing the detailed scope of work by task:
    Execution of contracts between Comal County and USGS: 8 weeks
    Installation of USGS gauging stations at 5 Comal County maintained dams: 6 months
16. Provide a Task Budget, identifying expenses by task.

TASK	DESCRIPTION	AMOUNT
1	Execute Contracts with USGS	$0
2	Install Gauging Stations at five different locations	$197,100
TOTAL		$197,100

17. Provide an Expense Budget, by category, for the proposed project.

CATEGORY	AMOUNT
Salaries and Wages	$0
Fringe	$0
Travel	$0
Subcontract Services	$197,100
Other Expenses	$0
Overhead	$0
Profit	$0
TOTAL	$197,100

18. Qualifications and direct experience of the project team.
    The work will be performed by USGS, who specializes in constructing, operating and maintaining these gauges. The USGS installed a gauge on the Shuetz Dam in Comal

County in 2016. In addition, USGS has installed 9 other gauges throughout Comal County. Finally, USGS has installed over 750 gauges throughout Texas.

19. Identify and describe how the project encompasses a watershed/basin.
    There are 5 dams in Comal County that are within the Dry Comal Creek watershed which feeds into the Guadalupe River Watershed. There is another dam Bleider's Creek Dam (TX01550) that is on the Guadalupe Watershed as well.
20. Assurance that the applicant has the authority to plan and implement projects in the project area.
    See Resolution
21. Assurance that the proposed project does not duplicate existing projects, with the exception of replacing outdated equipment.
    See Resolution
22. **See Resolution**